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Application/Control Number: 09/874,008

Art Unit: 2652

**CLMPTO** 

09/874,008

06/06/2001

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I. Multi-corrier communication system wherein data are transferred bi-directionally in a time division duplicated way, and wherein a first pilot carrier whose instantaneous frequency is a traction of a sample rate of a first transceiver (VDSL\_II) and which is crimagonal to other corresponding admitted and transceiver (VDSL\_III) and which is system, is transferred to enough a second franceiver (VDSL\_NII) to recover solid sample rate.

frequency is a fraction of a time-striken-duplikking-frame-tote-and-which is orthogonal to other comers used in soid multi-confer communication system, is transferred from soid list transceiver (VOSL\_NT) to enable said second transceiver (VOSL\_NT) to enable said second transceiver sold time division studiesing frame rate, said second pilot carrier being different from said list pilot carrier.

- Musti-carrier communication system according to claim?
  CHARACTERISED IN THAT said first pilot carrier is constituted by interpolating a piorality of carriers.
- (Angested) Multi-carrier communication system according to claim 1-westsine 2.
  CHARACTERISED IN THAT said first prior carrier und/or said second pilot carrier mo/is randomised.
- (Augusts) Meta-certer communication system according to distin 1-or chime).
  CHARACTERISED IN THAT said first pilot certics and/or said second pilot ratries are included with data.

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5. Multi-carrier transmitter (VOSL\_LT) suitable for use in a time division duplexing system, sold multi-carrier transmitter (VOSL\_LT) comprising:

a. list pilot carrier generation means (IFFL DAC), adapted to generate a first pilot carrier whase instantaneous frequency is a traction of a sample rate and writch is orthogonal to other corriers transmitted by sold transmitter (YDSL\_LIT); and

b, first pilot carrier transmission means, coupled to said first pilot carrier generation means (IFFT, DAC) and adapted to transmit said first pilot carrier.

CHARACTERISED IN THAT sold multi-gorden fromsmitter (VOSL\_LT)

C. seems pilet coming good atom maying RCT. (FF), 175, 15AC, PLL), adapted to generate a second pilot coming whose mean the awards is a fraction of a time division duplexing frame rate and which is orthogonal to other carders boussissed by sold transmitter, sold second pilot camer being different from sold first pilot carrier, and

d. second pilot currier licosmission means, coupled to said second pilot carder generation means (ROI, 1991, T/S, DAC, PLL) and adapted to transmit said second pilot carder.

6. Multi-content receiver (VDSLNT) suitable for use in a time division displexing system, said multi-content receiver (VDSLNT) comprising:

a first pilot confer receiving means (ACC, S/D, FFT, ROTT, PILT), adapted to receive a first pilot confer whose instantoneous

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trequency is a fraction of a transmitter sample rate and which is arthogonal to other confers received by said multi-Carrier receiver [VDSL\_NT].

OHARACTERISED IN THAT sold multi-confer receiver (VOSIL,NT) further comprises:

b, second pilot corner receiving means (ADC, 5/D, FFT, RO12, RO11, PLL), PLL2), adopted to receive a second pilot carrier whose mean frequency is a fraction of a time division duplexing frame rate and which is orthogonal to other carrier received by sold multi-carrier receiver (VDSL\_NE), said second pilot carrier being different from said first pilot carrier.